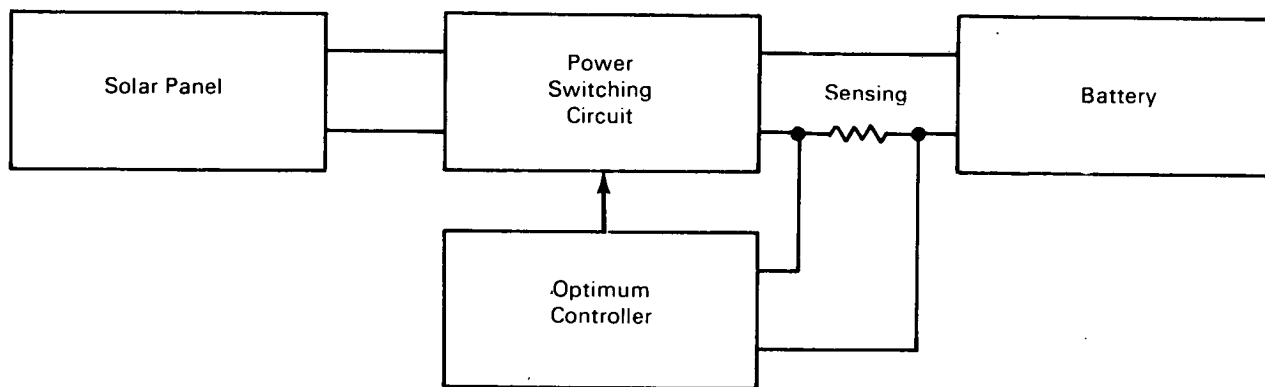


NASA TECH BRIEF



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Nondissipative Optimum Charge Regulator



System Block Diagram

In systems that depend on storage batteries for their operating energy, constant level charge/discharge control of the batteries is essential. Where the power supply (such as the solar cell array in a spin-stabilized satellite) offers a widely varying input to the batteries, an optimum charge regulator has been designed that provides the desired control.

The basic power transfer and control is performed by the system shown in the block diagram. The solar panel is coupled to the battery by the power switching circuit. Power transferred by the switching circuit is a function of its switching duty cycle, which is controlled by the optimum controller as it senses the battery current and modifies the duty cycle of the switching circuit, in a manner which maximizes the current available to the battery at all times. The basic power transfer mechanism is that of energy storage in an inductor (a component of the optimum controller circuitry) during the first portion of a switching cycle, followed by release of this energy to the battery during the following portion of the switch-

ing cycle. In the power switching circuit a transistor is driven by a fixed-frequency, variable-duty-cycle square wave. As the duty cycle changes, the amount of energy stored in and subsequently released from the inductor changes.

Notes:

1. This innovation could be useful in remote site battery-powered applications where power inputs may vary.
2. The following documentation may be obtained from:

Clearinghouse for Federal Scientific
and Technical Information
Springfield, Virginia 22151
Single document price \$3.00
(or microfiche \$0.65)

Reference: NASA-CR-79093 (N67-12215),
Nondissipative Solar Array Optimum
Charge Regulator

(continued overleaf)

Patent status:

No patent action is contemplated by NASA.

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Jerome N. Vitebsky of
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